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FLOOD INSURANCE STUDY

CHELAN COUNTY, WASHINGTON
UNINCORPORATED AREAS
VOLUME 1 OF 2

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Federal Emergency Management Agency

COMMUNITY NUMBER - 530015

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY
CHELAN COUNTY, WASHINGTON (UNINCORPORATED AREAS)

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the unincorporated areas of Chelan County, Washington, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

This Flood Insurance Study revises and updates a previous Flood Insurance Study/Flood Insurance Rate Map (FIRM) for the unincorporated areas of Chelan County, Washington, dated August 4, 1980. This information will be used by Chelan County to update existing floodplain regulations as part of the Regular Phase of the NFIP. The information will also be used by local and regional planners to further promote sound land use and floodplain development.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for the original study were performed by CH2M Hill, Inc., the study contractor for the Federal Insurance Administration (FIA), under Contract No. H-3815. This study was completed in October 1976.

A revision to the Flood Insurance Study was performed in order to add delineations of detailed flooding on Wenatchee River and Nason Creek, and to revise detailed flooding on Dry Gulch. The hydrologic and hydraulic analysis for this restudy were performed by CH2M Hill Northwest, Inc., the study contractor, under Contract No. EMW-85-C-18-93. This study was completed in June 1987.

1.3 Coordination

The Regional Planner for the county, who served as the local coordinator for the original study, identified sources of information from a variety of materials, and provided information on flooding conditions in the county. Through coordination with the County Engineer, numerous useful maps and information concerning flood history was obtained.

Among those agencies contacted for information were the Washington State Highway Department, Department of Ecology, and Department of Natural Resources. Meetings were held with the managers of several irrigation districts to discuss flooding conditions. Mapping and technical information were obtained through coordination with the Chelan County Public Utility Districts. In addition, R.W. Beck and Associates was contacted for mapping and technical information on specific flooding sources in the county.

At the Federal level, the U.S. Geological Survey (USGS) was contacted for gaging station information, flood prone area maps, and other study information. The U.S. Soil Conservation Service (SCS) provided soils information and various other data. Several meetings were held with the U.S. Army Corps of Engineers (COE), Seattle District, during the course of study to resolve differences in hydrology and hydraulics. Coordination with the COE yielded a variety of additional technical information.

The U.S. Forest Service was contacted for hydrological information, and the National Park Service provided land use data.

The initial Consultation and Coordination Officers (CCO) meeting for the original study was held in Wenatchee, on July 7, 1975. The purpose of the meeting was to familiarize government agencies and the public with all aspects of the study and to solicit information on the study area. Many local officials and citizens provided useful information with regard to past flooding in the county.

A meeting was held on June 23, 1976, to familiarize local officials with the results of the study. Their comments were incorporated in this report. Accordingly, No. 1 and No. 2 Canyons were re-evaluated by Dames & Moore according to the alluvial fan methodology developed by the FIA.

The results of this study were reviewed at a final CCO meeting held on September 25, 1979. Attending the meeting were representatives of the FIA, study contractor, and county.

On January 18, 1985, representatives of FEMA, Chelan County, and the study contractor identified additional streams requiring detailed analyses to be performed in a restudy. The goals of that meeting were to inform the county of its status in the NFIP, identify existing flooding problems and available pertinent data on flooding in the county, and reach an agreement on the areas to be studied.

During the course of the restudy, additional contacts and meetings were held with local community officials, consultants of the county, and various agencies to discuss flooding history, methods of analysis, and any proposed drainage system improvements to the flooding sources under study.

Results of the hydrologic analyses for the restudy were also coordinated with community officials, COE, and USGS.

On July 11, 1988 the results of the restudy were reviewed at a final CCO meeting attended by representatives of the study contractor, FEMA, and community. The study was acceptable to the community.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the unincorporated areas of Chelan County, Washington. The incorporated communities of Cashmere, Chelan, East Wenatchee, Entiat, Leavenworth, and Wenatchee are not included in this study. The area of study is shown on the Vicinity Map (Figure 1).

The Columbia, Wenatchee, and Entiat Rivers represent the three major drainage systems within Chelan County.

The Columbia River forms the eastern boundary of Chelan County, and is completely regulated within the county by a series of hydroelectric dams. Approximate methods were used to study developed areas adjacent to the Columbia River.

Tributaries to the Columbia River studies by detailed methods include No. 1 Canyon, No. 2 Canyon, Dry Gulch, and portions of Squilchuck Creek. Antoine Creek as well as portions of Squilchuck Creek were studied by approximate methods.

The Wenatchee River was originally studied by detailed methods from its confluence with the Columbia River upstream to a point approximately 0.66 mile upstream of Icicle Road, and then from a point approximately 1.5 miles downstream of the Burlington Northern Railroad crossing to Lake Wenatchee. The lower reaches of Mission, Peshastin, Icicle, and Chumstick Creeks, and the Chiwawa, Entiat, Mad, and Stehekin Rivers, and Squilchuck Creek, and all tributaries to the Wenatchee River, were studied in detail. Other tributaries of the Wenatchee River studied by approximate methods include White and Little Wenatchee Rivers, and the upper reaches of Peshastin Creek. Nason Creek was also originally studied by approximate methods.

Flowing into Lake Chelan, which is located in the northeastern portion of the county, are the Stehekin River and Railroad Creek.

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

APPROXIMATE SCALE

2.5 0 2.5 5 7.5 MILES

VICINITY MAP

Portions of the Stehekin River were studied by detailed methods while approximate methods were used in the study for portions of Railroad Creek. A portion of Lake Chelan adjacent to the Town of Mason was studied by approximate methods.

A restudy was performed on certain stream reaches which were previously not studied by detailed methods, or stream reaches that have undergone significant hydrologic and hydraulic changes since the completion of the original Flood Insurance Study. Dry Gulch was restudied by detailed methods from approximately 600 feet upstream of Miller Street to its confluence with the Columbia River. Flood hazard areas shown upstream from that location on the Asamera Minerals property in the original Flood Insurance Study will be eliminated from the maps due to the confined nature of the drainage course and the reduced discharges for this study. The Wenatchee River was studied by detailed methods for 2.0 miles downstream of the downstream limits of the previous detailed study. In addition, at the request of Chelan County and FEMA, restudy of the Wenatchee River, extending upstream from the downstream limit of the added study to approximately River Mile (RM) 42.0, was completed to include a split floodway analysis in the north overbank, downstream of the Burlington Northern Railroad. Additionally, Nason Creek was studied by detailed methods from the Burlington Northern Railroad bridge at RM 13.2, downstream to the Kahler Creek Road bridge.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through 1992.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to and agreed upon by FEMA and Chelan County.

2.2 Community Description

Chelan County, comprising an area of approximately 2,918 square miles, is located in the north-central part of Washington State, between the crest of the Cascade Mountains to the west and the Columbia River to the east. The county is surrounded by Okanogan County to the northeast, Douglas County to the southeast, Kittitas County to the south, Snohomish County to the west, and Skagit County to the northwest.

The population of the county was approximately 48,500 in 1985, with about 23,800 residing in the unincorporated areas. Slow, steady growth is expected in the future.

An extremely diversified topography and climate exists within the county. The higher elevations of the Cascade Mountains receive over 160 inches of precipitation annually, but the climate along the Columbia River (elevation 600 feet) is semi-arid, with annual precipitation of approximately 10 inches. Temperatures reflect similar patterns. The highest summer temperatures reach

approximately 100°F along the Columbia River and change to significantly lower temperatures in the mountains.

Vegetation also varies greatly throughout the county. The high western portion of the county abounds in dense pine, fir, and cedar forests, whereas the arid eastern portion is covered primarily by sagebrush and native grasses. In addition, fruit orchards are located in the irrigable lands along the rivers.

For the Stehekin, Chiwawa, and upper Wenatchee Rivers, and for Icicle, Peshastin, and Railroad Creeks, the vegetation and topography are similar. The valley walls are steep and heavily forested by fir, cedar, and pine. The much flatter valley floors, which widen as the rivers progress, are covered by similar vegetation, brush, or open fields.

For the lower Wenatchee, Entiat, and Mad Rivers, Mission, Squilchuck, Antoine, Chumstick and Nason Creeks, No. 1 and No. 2 Canyons, Dry Gulch and Lake Chelan near Manson, the vegetation and topography are similar. Along the upper reaches, the valley walls are steep and heavily forested with pine. As the river progresses downstream, this gradually changes to only scattered pine, with sagebrush and native grasses on the more gently sloping ridges. The valley floors follow a similar pattern or else are covered by brush, fields, or orchards.

For the most part, the floodplains in Chelan County have not been developed extensively for commercial, industrial, or residential uses. The prime alluvial floodplain soils have been developed almost exclusively for agricultural use, the majority being orchards. An exception to this is the area adjacent to the City of Wenatchee. Urban development there has begun to encroach upon agricultural lands that lie below the mouths of several canyon drainages.

2.3 Principal Flood Problems

Flooding problems within Chelan County are usually the result of spring snowmelt, thunderstorms, or warm winter rains on snow. As a rule, the spring snowmelt floods and winter floods do not cause extensive damage because high flows occur quite frequently. This has helped to limit development along the major stream systems. Thunderstorms typically cause more problems and damage, primarily because the heavy rainfall and runoffs occur less frequently.

Major floods along the major streams have occurred in 1948 (the flood of record), 1972, and 1980. Numerous, less severe floods have occurred in the intervening years. Flooding due to thunderstorms seldom covers areas greater than 10 square miles. At least one significant flooding event occurs within the county nearly every year. Extremely damaging storms occurred in 1957 and 1972. Ice jams occur on many of the major streams during the winter season.

On the Wenatchee River, the peak recorded discharge at the stream gage located at Plain is 22,700 cubic feet per second (cfs). This represents an estimated 100-year recurrence interval based on frequency curve computations for the 68 years of gage record through 1979.

Although no stream gage records exist on Nason Creek, estimates of floodflows for two historic events have been made by the USGS. It has been assumed that those estimates reflect discharges at the mouth of Nason Creek, downstream of the limits of this study; those include an event in November 1959, estimated at 6,860 cfs, and the 1948 event peak floodflow estimated at 5,270 cfs.

Dry Gulch drains a series of tributary canyons south and west of the City of Wenatchee and eventually discharges directly to the Columbia River. The steep stream gradients and minimal ground cover within the basin result in rapid runoff response to the high intensity rainfall characteristic of summer thunderstorms, in addition to longer duration winter rains and spring snowmelt runoff. The flood of 1957 at the mouth of Canyon No. 2, an adjacent hydrologically similar basin, has been reported by the COE to have a peak flow of 1,470 cfs, representing an approximate 50- to 100-year recurrence interval. Floods on Dry Gulch carry high sediment loads that are deposited when the channel decreases its slope on emerging from its canyon.

2.4 Flood Protection Measures

At the present time, there are no major flood control projects in the county. However, landowners along most of the streams have built low levees to protect their land from flooding. These flood control structures appear to be extremely effective against typical high spring runoff; however, they are not intended to control major floods. In addition, a number of channel modification projects have been built in conjunction with highway improvement projects.

Dams along the Columbia River, including those in Chelan County, have been constructed primarily for power production. Their regulation has had a significant impact upon floodflows, and has lessened the chance of significant flood damage.

The recent development by Asamera Minerals (U.S.), Inc., of their Canyon Mine project near the mouth of the Dry Gulch Canyon has significantly altered the peak flow runoff characteristics of that drainage. That development included construction of a tailings impoundment dam near the mouth of the South Fork Canyon that effectively eliminates peak storm discharges from that fork. A low-flow diversion pipeline is provided that will divert a maximum of 25 cfs from the South Fork around the impoundment structure (Reference 1).

As part of the Shorelines Management Program, Chelan County has adopted regulations that should be effective in minimizing future damages along the main stream systems. These regulations currently

require that all new buildings be at an elevation of at least 2 feet above the 100-year flood elevation.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual excedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the county.

Unless otherwise noted, all frequency-discharge analyses in Chelan County for streams with gaging station records were made using the standard log-Pearson Type III method (Reference 2). The weighted average of the regional skew coefficient (Reference 3) and the station-generated value was determined according to the method outlined in the U.S. Water Resources Council Bulletin 17 (Reference 4).

For the Wenatchee River, floodflow-frequency data were based upon the records of five USGS gaging stations. These include the following stations: below Lake Wenatchee (43 years), at Plain (62 years), at Peshastin (46 years), at Dryden (12 years), and at Monitor (12 years). The short-term records at Monitor and Dryden were adjusted based upon inflow and the long-term records for the Plain and Peshastin gages.

For the restudied portion of the Wenatchee River, the discharge-frequency relationship was developed from the USGS Gage 12-457000 on the Wenatchee River at Plain, for its 68 years of operation from 1911 to 1979. The Flood Flow Frequency Analysis (FFFA) computer

program (Reference 5) was used to determine the discharge-frequency relationship by applying log-Pearson Type III analysis techniques in accordance with methods presented in USGS Bulletin 17B (Reference 6), to annual peak flow data. Comparison of the results of this analysis with the flows published in the original Chelan County Flood Insurance Study for the gage site at Plain, indicated no significant statistical differences. Therefore, in accordance with FEMA guidelines, the flow estimates reported in the original study for the Wenatchee River at Plain have been used in this restudy as the basis for the flow estimates calculated for the study reach. Discharge-frequency relationships established for the gage site were transferred to selected runoff concentration points along the study reach through application of regional regression techniques per published regression equations (Reference 7).

For Icicle Creek, the frequency analysis was based upon the 40 years of record at the USGS gaging station above Snow Creek. For Mission Creek, gaging stations above Sand Creek and at Cashmere with 17 and 20 years of record, respectively, were used in the analysis. The station-generated skew coefficient (1.8) and regional skew value (-0.1) gave values for the 100- and 500-year floods that were inconsistent with adjacent basins. A skew coefficient of 1.1 was adopted because it gave values that were consistent with peak flow and flow-per-square-mile ratios of adjacent basins.

There are no gaging station records for Peshastin Creek. The regional analysis report was used as a base to compute flows on Peshastin Creek along with the gaging station data from the adjacent Icicle Creek basin. Since the regional analysis for Icicle Creek gave results lower than the log-Pearson Type III analysis of the gage records, the results of the regional analysis for Peshastin Creek were increased consistent with the increase at Icicle Creek because of the similarity of the two basins.

For the Chiwawa River, the frequency-discharge analysis, based upon 17 years of record at the gage near Plain, was extended based upon the Wenatchee River at Plain. The stations correlated well and the adjusted flows were used.

Since there are no flow records for Chumstick Creek, an attempt was made to use the regional analysis. However, the regional analysis for all nearby basins consistently produced results lower than the log-Pearson Type III analysis. In addition, direct comparison with the Chumstick Creek basin varies markedly from these other areas. As a result, nine drainage basins with similar characteristics were used to develop an average ratio comparing the regional analysis results with the log-Pearson Type III analysis for each basin. The Chumstick Creek regional analysis results were then increased by this ratio.

There are no continuous stream gaging records available for Nason Creek. Therefore, the flow estimates for Nason Creek were based on the transfer of the results of an analyses of the gage data for the

hydrologically similar Icicle Creek basin. The USGS gage on Icicle Creek (No. 12-458000, near Leavenworth) has 42 years of flow records for the period from 1937 to 1979. Statistical analyses using log-Pearson techniques were used to develop the discharge-frequency relationship for the period of record at that gage. The recurrence interval discharges for the various locations along Nason Creek were computed by the transfer of the Icicle Creek flows through the application of regional regression techniques per published regression equations (Reference 7).

The frequency-discharge analysis for the Stehekin River was based upon the 47 years of record at the USGS gaging station at Stehekin. For No. 1 and No. 2 Canyons, the discharges were taken from data previously developed by the COE.

Stream flow records are not available for Dry Gulch. Recurrence interval discharge estimates provided in the original Chelan County Flood Insurance Study for Dry Gulch are no longer appropriate, due to the approximately 60 percent effective reduction in contributory drainage basin area with the dam construction on the South Fork. Indirect methods were used to estimate revised peak discharges based on regression relationship transfer of COE discharge estimates previously developed for the hydrologically similar Canyon No. 1 drainage (Reference 8). A transfer of discharge estimates was made based on the revised drainage area, with the South Fork drainage assumed noncontributory, except for the added diversion flow of 25 cfs.

For Squilchuck Creek, National Weather Service rainfall records (Reference 9) were used in computing flood flow data using the unit hydrograph procedure outlined by the SCS (Reference 10). The 100-year flow report by R.W. Beck and Associates (Reference 11). Consequently, the R.W. Beck value was adopted for the 100-year flood, and the unit hydrograph curve was adjusted to pass through that point.

For the Entiat River, the two gaging stations at Entiat and near Ardenvoir, with 23 and 18 years of record, respectively, are operated by the USGS, and the 100-year flows are presented in the report by R.W. Beck. The log-Pearson Type III analysis for the station at Entiat was found to agree very closely with the R.W. Beck values. While the flows near Ardenvoir were slightly higher than those proposed by Beck; the adjusted analyses agreed quite closely when the flow record was correlated with nearby stations. For the Mad River, a major tributary of the Entiat River, the regional analysis was used due to a lack of any gaged records.

A summary of discharges for the streams studied by detailed methods within the county is shown in Table 1.

TABLE 1. SUMMARY OF DISCHARGES

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Year	50-Year	100-Year	500-Year
Wenatchee River					
At Monitor Gage	1,301	25,700	32,100	34,600	40,100
At Dryden Gage	1,155	25,200	31,500	34,000	39,400
At Peshastin Gage	1,000	23,900	29,700	31,900	36,800
At South Line S34, T26N, R17E	606	17,600	21,500	23,000	26,000
At Plain Gage	591	17,200	21,000	22,500	25,500
At Lake Gage	273	10,000	12,100	13,000	14,800
Mission Creek					
At Southern City Limits of Cashmere	82	660	1,780	2,600	5,700
Peshastin Creek					
At Mouth	143	1,980	3,210	3,790	5,130
Icicle Creek					
At Mouth	213	7,930	11,000	12,360	15,650
Chumstick Creek					
At Mouth	82	900	1,430	1,720	2,810
At Eagle Creek Road	50	560	900	1,200	1,820
At Cross Section AP	41	470	760	930	1,520
At Sunitsch Canyon Road	31	400	640	770	1,250
Chiwawa River					
At Mouth	190	4,900	6,500	7,200	8,800
Nason Creek					
At Kahler Creek Bridge	98.6	4,270	5,860	6,590	8,250
Above Kahler Creek Confluence	91.2	3,990	5,490	6,170	7,720
Below Butcher Creek Confluence	87.5	3,850	5,290	5,960	7,460
Below Roaring Creek Confluence	76.3	3,430	4,720	5,320	6,670
Above Gill Creek Confluence	70.8	3,220	4,440	5,000	6,260
At Merritt	67.5	3,090	4,270	4,810	6,020
At Burlington Northern RR Bridge	64.2	2,960	4,090	4,610	5,780

TABLE 1. SUMMARY OF DISCHARGES (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Year	50-Year	100-Year	500-Year
Entiat River					
At Mouth	419	6,000	8,000	8,900	11,000
At Fish Hatchery Road	343	5,600	7,500	8,300	10,500
At Mad River Road	251	5,100	6,700	7,400	9,200
At Cross Section CJ	203	4,700	6,200	6,900	8,400
Mad River					
At Mouth	92	1,200	1,750	2,000	2,500
Stehekin River					
At Mouth	344	14,400	17,900	19,200	22,100
At Cross Section J	308	13,200	16,500	17,700	20,300
At Cross Section U	277	12,200	15,200	16,300	18,800
Squilchuck Creek					
At Mouth	28	400	950	1,300	2,500
At Cross Section Y	15	300	750	1,000	1,900
No. 1 Canyon					
At Mouth	8	500	1,200	1,650	3,100
No. 2 Canyon					
At Mouth	10	600	1,450	1,950	3,700
Dry Gulch					
At Mouth	1.6	140	300	410	760

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross section data for the backwater analyses for streams studied by detailed methods in the original study were obtained using one of two methods.

Where detailed topographic maps were available, the cross section data were taken directly from the maps. In areas where no mapping was available, topographic maps were prepared photogrammetrically for the floodplain area and cross sections were digitized for input directly to the computer program. Underwater channel geometry at each cross section and at each bridge, culvert, or other water control structure was determined by field inspection. For the restudy, cross section data for the backwater analyses on Nason Creek and the restudied portion of the Wenatchee River were obtained by field survey. All bridges, culverts, and other hydraulic structures were surveyed to obtain elevation data, structural geometry, and hydraulic condition. Topographic maps compiled from aerial photographs (Reference 12) were used to provide additional ground surface elevation data.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2).

Roughness factors (Manning's "n") used in the hydraulic computations were chosen by engineering judgment and based on field observations of the streams and floodplain areas. Roughness values for Nason Creek ranged from 0.038 to 0.050 for the channel and from 0.080 to 0.100 for the overbank areas. For the remaining streams, roughness values ranged from 0.035 to 0.055 for the channel and from 0.045 to 0.100 for the overbank areas.

Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 13).

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals. Starting water-surface elevations for Squilchuck Creek, Entiat River, and the mouth of the Wenatchee River were determined from backwater curves for the Columbia River (References 14 and 15). The starting elevations for Mission Creek, Peshastin Creek, Chumstick Creek, Icicle Creek, Chiwawa River, and Mad River were based on the water-surface profiles determined for the Wenatchee River and Entiat River. The slope-area method was used for all other starting points or where backwater on the tributary did not control.

The restudied portion of the Wenatchee River, upstream of the added study reach, considered the natural split of flows to overflow areas in the north overbank, downstream of the Burlington Northern Railroad Bridge. Surveyed cross section data provided by FEMA for the overflow areas were used in conjunction with the existing study sections to model the backwater effects for that section.

No. 1 and No. 2 Canyons were studied by detailed methods according to alluvial fan flooding guidelines developed by the FIA. Statistical analyses were used to compute flood depths and velocities for those areas that are subject to alluvial fan flooding. Topographic maps (References 16 through 18), soil reports (Reference 19), COE reports (References 20, 21, 22, and 23), and information on historical floods obtained from discussions with city officials were used in this analysis.

As part of the restudy, Dry Gulch was studied by detailed methods according to the 1985 alluvial fan flooding guidelines developed by the FIA. Statistical analyses were used to compute flooding depths and velocities for those areas which are subject to alluvial fan flooding. Topographic data for the alluvial fan analyses for Dry Gulch were obtained from the original Flood Insurance Study for Chelan County (Reference 24).

As noted previously, flood elevations for the Entiat River and Icicle Creek in Chelan County are sometimes raised by ice jams during spring thaws; the hydraulic analyses for this study, however, are based only on the effects of unobstructed flow. The flood elevations as shown on the profiles for all of the streams studied by detailed methods are thus considered valid only if hydraulic structures, in general, remain unobstructed, and dams and other flood control structures operate properly and do not fail.

Approximate studies on Nason Creek, Little Wenatchee River, portions of Squilchuck and Peshastin Creeks, and Antoine Creek were based upon available topographic mapping, generalized relationships between depth and frequency, and field observations. The approximate study for the White River was based upon a report by the USGS (Reference 25). The approximate study of the Columbia River was performed using the design backwater curves developed by Stone and Webster, engineers for the Chelan County Public Utility District (Reference 15). These curves were developed to reflect the effect of the operation of Rock Island Dam on the water-surface profile of the Columbia River. These design curves are based on current conditions at Rock Island Dam, including the new turbines that were being added at the time of the original study. The design curves also represent the expected maximum flood at Rock Island Dam considering major historical floods and the flood protection provided by several upstream reservoirs.

All elevations are referenced to the National Geodetic Vertical Datum (NGVD) of 1929. Elevation reference marks used in this study are shown on the maps.

4.0 FLOODPLAIN MANAGEMENT

The NFIP encourages state and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study produces maps designed to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:4,800 with a contour interval of 4 feet (Reference 12), 1:2,400 with a contour interval of 5 feet (Reference 16), 1:1,200 with a contour interval of 5 feet (Reference 17), 1:4,800 with a contour interval of 10 feet (Reference 18), 1:62,500 with a contour interval of 20 feet (Reference 26), and photomosaics at scales of 1:6,000 (Reference 27) and 1:12,000 (Reference 28).

For the streams studied by approximate methods, the boundary of the 100-year flood was developed from depth-frequency relationships and topographic maps, photomosaics (References 16 through 18 and 26 through 28), and maps of flood prone areas (References 29 and 30).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map/scale and or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The

floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the floodplain, with exception to points where hazardous velocities exist, and a reach along the restudied portion of the Wenatchee River. For that reach, a split floodway concept was used for the main channel and overbank, based on preliminary alignments agreed upon by Chelan County and FEMA. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 2).

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were computed at cross sections; between cross sections, the boundaries were interpolated. In cases where the floodway and the 100-year floodplain boundaries are either close together or collinear, only the floodway boundary has been shown. The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

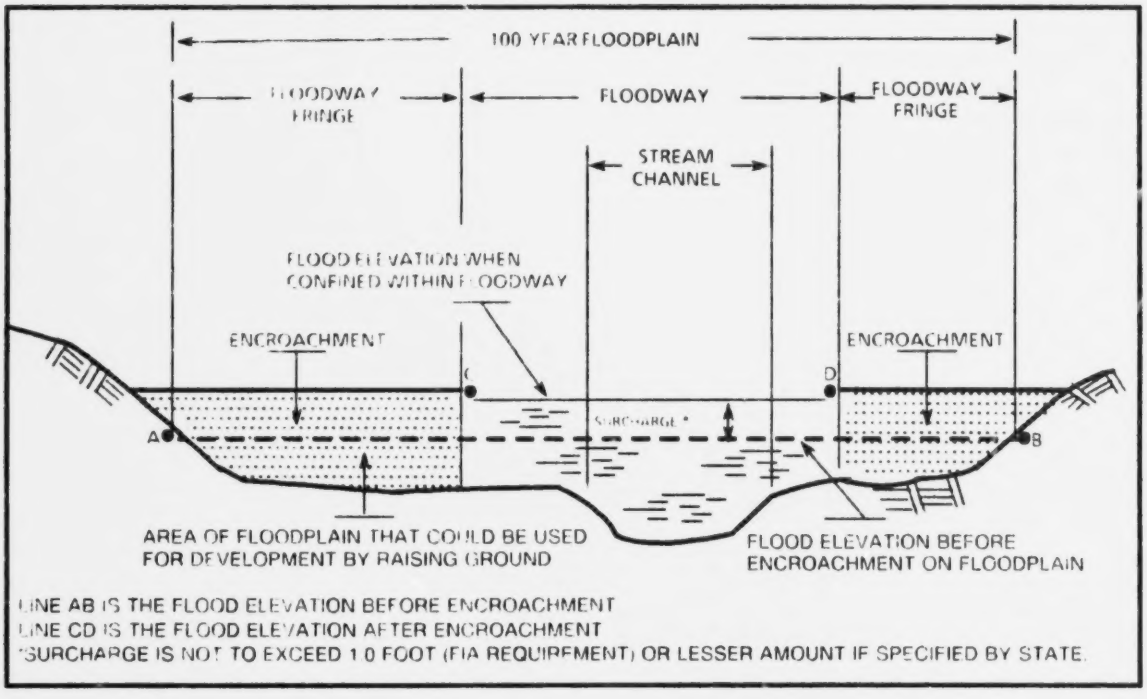
100 YEAR FLOODPLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
A
B
SURCHARGE *
AREA OF FLOODPLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOODPLAIN
LINE AB IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE CD IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE IS NOT TO EXCEED 1.0 FOOT (FIA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

Figure 2. Floodway Schematic

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Wenatchee River							
A	0.64	1,800	18,971	1.8	628.8	628.8	0.0
B	0.82	810	9,923	3.5	628.8	628.8	0.0
C	0.95	410	6,512	5.3	629.0	629.0	0.0
D	1.12	235	4,477	7.7	629.3	629.2	0.1
E	1.31	185	3,019	11.5	630.0	629.9	0.1
F	1.50	270	3,971	8.7	632.8	632.8	0.0
G	1.92	240	3,004	11.5	636.1	635.7	0.4
H	2.18	290	2,602	13.3	640.1	639.6	0.5
I	2.45	550	4,943	7.0	645.9	645.1	0.8
J	2.78	485	3,457	10.0	649.2	648.4	0.8
K	2.98	325	3,360	10.3	652.7	651.7	1.0
L	3.12	315	3,289	10.5	654.6	653.8	0.8
M	3.26	300	3,648	9.5	657.2	656.2	1.0
N	3.33	345	3,695	9.4	657.9	657.2	0.7
O	3.56	655	5,882	5.9	660.8	659.8	1.0
P	3.80	770	6,751	5.1	662.6	661.6	1.0
Q	4.01	400	2,790	12.4	664.6	664.0	0.6
R	4.23	355	3,950	8.8	671.1	670.2	0.9

[1]Miles Above Confluence With Columbia River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

WENATCHEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Wenatchee River (continued)							
S	4.39	455	4,033	8.6	672.9	672.5	0.4
T	4.52	540	5,275	6.6	674.6	674.3	0.3
U	4.73	275	3,488	9.9	675.7	675.5	0.2
V	4.95	415	3,606	9.6	679.0	678.6	0.4
W	5.22	400	2,754	12.6	684.4	684.2	0.2
X	5.46	260	3,353	10.3	690.2	689.9	0.3
Y	5.68	285	3,065	11.3	694.1	693.2	0.9
Z	5.85	180	3,353	10.3	696.7	695.7	1.0
AA	5.93	180	3,119	11.1	698.0	697.4	0.6
AB	6.15	190	2,810	12.3	700.6	699.8	0.8
AC	6.43	735	5,688	6.1	705.2	704.5	0.7
AD	6.71	315	2,147	16.1	708.4	708.3	0.1
AE	6.88	220	3,146	11.0	714.7	714.7	0.0
AF	7.11	225	3,319	10.4	717.4	717.0	0.4
AG	7.14	245	3,411	10.1	718.0	717.5	0.5
AH	7.27	360	4,670	7.4	720.3	719.8	0.5
AI	7.43	260	3,013	11.5	721.1	720.9	0.2

[1]Miles Above Confluence With Columbia River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

WENATCHEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Wenatchee River (continued)							
AJ	7.53	280	2,987	11.6	722.5	721.5	1.0
AK	7.64	320	3,280	10.5	725.0	724.7	0.3
AL	7.71	210	2,903	11.9	726.2	726.2	0.0
AM	7.79	220	3,113	11.1	727.6	727.5	0.1
AN	7.96	205	2,654	13.0	729.4	729.0	0.4
AO	8.12	245	2,718	12.7	732.7	732.1	0.6
AP	8.26	295	3,753	9.2	737.8	737.0	0.8
AQ	8.38	375	2,967	11.7	738.7	738.0	0.7
AR	8.46	400	3,238	10.7	740.3	740.2	0.1
AS	8.55	280	3,114	11.1	742.9	742.9	0.0
AT	8.67	280	2,969	11.7	744.9	744.8	0.1
AU	8.81	195	2,505	13.8	747.1	747.0	0.1
AV	8.97	215	3,318	10.4	750.6	750.0	0.6
AW	9.12	210	3,136	11.0	751.9	751.1	0.8
AX	9.25	165	2,607	13.3	753.2	752.5	0.7
AY	9.44	210	3,396	10.2	756.7	755.8	0.9
AZ	9.56	255[2]	3,867	8.9	757.7	756.9	0.8

[1]Miles Above Confluence With Columbia River [2]This Width Extends Beyond County Limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

WENATCHEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Wenatchee River (continued)							
BA	9.64	335[2]	4,348	8.0	759.1	758.1	1.0
BB	9.66	325[2]	4,944	7.0	761.9	761.1	0.8
BC	9.72	430[2]	6,382	5.4	762.4	761.4	1.0
BD	9.92	335[2]	3,798	9.1	762.7	761.7	1.0
BE	10.10	335	3,319	10.4	764.8	764.5	0.3
BF	10.26	335	3,202	10.8	767.5	767.4	0.1
BG	10.42	300	2,568	13.5	770.7	770.7	0.0
BH	10.44	270	2,412	14.3	771.2	771.2	0.0
BI	10.63	290	2,433	14.2	778.2	778.2	0.0
BJ	10.81	350	2,779	12.2	785.5	784.7	0.8
BK	11.01	235	2,573	13.2	790.9	790.9	0.0
BL	11.11	240	2,169	15.7	793.3	793.3	0.0
BM	11.25	200	2,334	14.6	798.9	798.9	0.0
BN	11.43	210	2,870	11.8	804.2	804.2	0.0
BO	11.54	165	2,860	11.9	805.7	805.4	0.3
BP	11.60	150	2,962	11.5	806.8	806.2	0.6
BQ	11.81	225	3,083	11.0	809.1	808.4	0.7

[1]Miles Above Confluence With Columbia River [2]This Width Extends Beyond The County Limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

WENATCHEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Wenatchee River (continued)							
BR	12.12	350	3,657	9.3	814.2	813.6	0.6
BS	12.30	280	3,927	8.7	816.7	816.4	0.3
BT	12.47	290	2,835	12.0	817.9	817.4	0.5
BU	12.62	230	2,695	12.6	821.7	821.7	0.0
BV	12.83	230	2,518	13.5	826.2	825.8	0.4
BW	13.03	295	2,910	11.7	831.4	831.2	0.2
BX	13.10	300	2,494	13.6	833.0	832.9	0.1
BY	13.26	370	3,094	11.0	838.3	838.3	0.0
BZ	13.41	345	2,214	15.4	842.4	842.4	0.0
CA	13.48	315	3,331	10.2	846.8	846.2	0.6
CB	13.61	365	2,846	11.9	847.9	847.3	0.6
CC	13.76	265	2,811	12.1	852.2	852.2	0.0
CD	13.93	170	2,635	12.9	855.2	855.0	0.2
CE	13.99	350	2,335	14.6	856.1	856.1	0.0
CF	14.05	260	3,254	10.4	859.4	859.4	0.0
CG	14.12	290	2,206	15.4	859.3	859.2	0.1
CH	14.28	240	3,050	11.1	865.2	865.2	0.0

[1] Miles Above Confluence With Columbia River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

WENATCHEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Wenatchee River (continued)							
CI	14.41	220	2,633	12.9	867.3	867.0	0.3
CJ	14.54	210	2,933	11.6	870.1	869.3	0.8
CK	14.67	405	4,579	7.4	873.0	872.1	0.9
CL	14.84	330	3,022	11.3	874.4	874.0	0.4
CM	15.06	170	2,132	15.9	879.3	879.2	0.1
CN	15.10	224	3,651	9.3	884.3	884.3	0.0
CO	15.19	300	4,075	8.3	885.2	885.1	0.1
CP	15.23	335	3,057	11.1	885.0	884.9	0.1
CQ	15.36	335	2,245	15.1	888.3	888.3	0.0
CR	15.49	260	2,764	12.3	894.3	893.6	0.7
CS	15.60	290	2,716	12.5	896.6	896.2	0.4
CT	15.79	315	3,708	9.2	901.2	901.0	0.2
CU	15.99	410	2,610	13.0	904.7	904.5	0.2
CV	16.15	245	2,361	14.4	910.3	910.3	0.0
CW	16.30	365	4,171	8.2	915.5	915.5	0.0
CX	16.38	240	2,722	12.4	915.5	915.5	0.0
CY	16.51	230	2,519	13.5	918.5	918.5	0.0

[1]Miles Above Confluence With Columbia River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

WENATCHEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Wenatchee River (continued)							
CZ	16.64	225	3,138	10.8	922.5	922.1	0.4
DA	16.67	295	3,728	9.1	923.9	923.6	0.3
DB	16.69	260	2,622	13.0	923.9	923.8	0.1
DC	16.83	220	2,490	13.7	927.7	927.0	0.7
DD	16.86	245	2,890	11.8	930.7	930.7	0.0
DE	16.99	200	2,892	11.8	931.8	931.4	0.4
DF	17.23	455	2,685	12.7	936.1	935.7	0.4
DG	17.42	250	2,744	12.4	944.7	944.7	0.0
DH	17.46	260	2,509	13.6	945.8	945.7	0.1
DI	17.66	245	2,129	16.0	953.8	953.8	0.0
DJ	17.85	240	2,572	13.2	963.5	963.4	0.1
DK	17.99	340	2,853	11.9	968.1	967.9	0.2
DL	18.18	310	4,470	7.6	979.7	979.7	0.0
DM	18.36	235	2,705	11.8	980.8	980.8	0.0
DN	18.52	205	2,576	12.4	983.8	983.8	0.0
DO	18.63	205	2,341	13.6	985.8	985.6	0.2
DP	18.74	320	2,978	10.7	991.3	991.3	0.0
DQ	18.86	700	2,279	14.0	996.8	996.8	0.0

[1]Miles Above Confluence With Columbia River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

WENATCHEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Wenatchee River (continued)							
DR	19.00	465	3,351	9.5	1,003.6	1,003.6	0.0
DS	19.14	345	2,804	11.4	1,006.1	1,006.1	0.0
DT	19.26	240	2,376	13.4	1,008.6	1,008.6	0.0
DU	19.33	190	2,575	12.4	1,010.9	1,010.3	0.6
DV	19.46	320	3,918	8.1	1,013.8	1,013.3	0.5
DW	19.62	235	2,916	10.9	1,015.0	1,014.4	0.6
DX	19.78	240	2,997	10.6	1,017.3	1,016.5	0.8
DY	19.92	340	4,247	7.5	1,019.6	1,018.7	0.9
DZ	20.08	295	2,711	11.8	1,020.7	1,020.0	0.7
EA	20.29	245	3,348	9.5	1,024.3	1,024.1	0.2
EB	20.48	220	2,653	12.0	1,026.2	1,026.0	0.2
EC	20.50	230	3,177	10.0	1,027.3	1,027.2	0.1
ED	20.79	180	2,783	11.5	1,031.7	1,031.0	0.7
EE	20.98	195	3,131	10.2	1,034.2	1,033.6	0.6
EF	21.15	240	3,430	9.3	1,036.1	1,035.3	0.8
EG	21.37	265	3,751	8.5	1,038.1	1,037.4	0.7
EH	21.54	215	3,157	10.1	1,039.2	1,038.6	0.6

[1]Miles Above Confluence With Columbia River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

WENATCHEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Wenatchee River (continued)							
EI	21.75	200	3,620	8.8	1,041.1	1,040.5	0.6
EJ	21.95	210	3,076	10.4	1,042.3	1,041.6	0.7
EK	22.17	190	3,032	10.5	1,044.6	1,044.0	0.6
EL	22.35	170	2,904	11.0	1,046.3	1,045.8	0.5
EM	22.47	160	2,693	11.8	1,047.5	1,046.7	0.8
EN	22.60	155	2,632	12.1	1,049.1	1,048.2	0.9
EO	22.79	160	2,708	11.8	1,051.7	1,050.7	1.0
EP	22.93	175	2,680	11.9	1,053.7	1,052.7	1.0
EQ	23.10	270	3,874	8.2	1,056.6	1,055.6	1.0
ER	23.27	245	2,452	13.0	1,058.1	1,057.6	0.5
ES	23.41	210	2,536	12.6	1,061.9	1,061.7	0.2
ET	23.50	225	3,247	9.8	1,065.3	1,065.3	0.0
EU	23.61	150	2,771	11.5	1,066.5	1,066.5	0.0
EV	23.73	175	2,985	10.7	1,068.2	1,067.9	0.3
EW	23.81	175	2,782	11.5	1,069.1	1,068.9	0.2
EX	23.91	225	4,027	7.9	1,071.7	1,071.2	0.5
EY	23.99	145	2,596	12.3	1,071.6	1,071.1	0.5

[1] Miles Above Confluence With Columbia River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

WENATCHEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Wenatchee River (continued)							
EZ	24.15	365	4,237	7.5	1,075.1	1,074.4	0.7
FA	24.21	280	2,601	12.3	1,075.1	1,074.4	0.7
FB	24.27	330[2]	3,109	10.3	1,077.7	1,077.6	0.1
FC	24.31	285[2]	2,232	14.3	1,078.3	1,078.2	0.1
FD	24.36	275[2]	2,264	14.0	1,080.4	1,080.4	0.0
FE	24.40	230[2]	2,016	15.7	1,083.3	1,083.3	0.0
FF	24.44	170[2]	1,819	17.4	1,086.8	1,086.8	0.0
FG	24.60	180[2]	2,241	14.1	1,094.4	1,094.4	0.0
FH	24.71	175[2]	2,540	12.4	1,097.4	1,097.4	0.0
FI	24.92	300[2]	3,921	8.1	1,102.4	1,102.4	0.0
FJ	25.15	350[2]	5,472	5.8	1,104.6	1,104.5	0.1
FK	25.34	320[2]	4,177	7.6	1,105.3	1,105.1	0.2
FL	25.51	1,180	9,960	3.2	1,106.6	1,106.2	0.4
FM	25.74	900	7,409	4.3	1,106.8	1,106.4	0.4
FN	25.96	1,310	10,212	3.1	1,108.0	1,107.3	0.7
FO	26.15	1,070	7,220	4.4	1,108.5	1,107.8	0.7
FP	26.34	1,245	8,060	3.9	1,109.2	1,108.2	1.0
FQ	26.60	1,160	7,450	4.2	1,110.5	1,109.7	0.8

[1]Miles Above Confluence With Columbia River [2]This Width Extends Beyond the County Limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

WENATCHEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	DIFFERENCE (FT)
Wenatchee River (continued)							
FR	26.79	630	4,980	4.7	1,111.1	1,110.5	0.6
FS	26.94	200	1,698	13.9	1,110.9	1,110.6	0.3
FT	27.10	285	3,426	6.9	1,116.0	1,115.7	0.3
FU	27.27	175	2,348	10.1	1,117.3	1,117.0	0.3
FV	27.44	215	1,577	15.0	1,121.7	1,121.7	0.0
FW	27.59	165	2,083	11.3	1,128.8	1,128.6	0.2
FX	27.78	170	1,497	15.8	1,133.1	1,133.0	0.1
FY	27.93	175	1,722	13.7	1,141.9	1,141.9	0.0
FZ	38.036	154	1,355	17.0	1,700.2	1,700.2	0.0
GA	38.195	287	3,474	6.6	1,705.8	1,706.6	0.8
GB	38.360	256	3,228	7.1	1,706.6	1,707.5	0.9
GC	38.561	200	2,216	10.4	1,708.4	1,709.2	0.8
GD	38.735	632	4,434	5.2	1,712.5	1,712.8	0.3
GE	38.991	412	2,885	8.0	1,715.2	1,715.4	0.2
GF	39.207	539	3,514	6.5	1,719.1	1,720.0	0.9
GG	39.469	249	2,588	8.9	1,723.9	1,724.4	0.5
GH	39.677	481	3,774	6.1	1,727.1	1,727.9	0.8
GI	39.849	199	1,933	11.9	1,729.4	1,729.6	0.2
GJ	40.057	283	2,885	8.0	1,733.6	1,734.4	0.8
GK	40.243	279	2,539	9.1	1,735.9	1,736.5	0.6
GL	40.442	197	2,307	9.8	1,739.0	1,740.0	1.0
GM	40.570	391	2,319	9.7	1,741.7	1,742.7	1.0
GN	40.700	203	1,777	12.7	1,746.0	1,746.0	0.0
GO	40.830	495	4,433	5.1	1,749.1	1,749.4	0.3
GP	40.970	303	2,428	6.6	1,749.8	1,750.1	0.3

[1]Miles Above Confluence With Columbia River

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	DIFFERENCE (FT.)
Wenatchee River (continued)							
GQ	41.110	306	2298	7.0	1,751.0	1,751.4	0.4
GR	41.220	240	2109	7.6	1,752.1	1,751.5	0.4
GS	41,370	367	2640	6.1	1,754.4	1,754.4	0.0
GT	41.500	188	1529	10.5	1,755.5	1,755.5	0.0
GU	41,660	405	2710	5.9	1,757.5	1,758.4	0.9
GV	41.760	406	2321	9.7	1,758.2	1,759.2	1.0
GW	41.860	261	2062	10.9	1,761.5	1,761.7	0.2
GX	41.890	296	2740	8.2	1,762.5	1,763.3	0.8
GY	41.910	328	2203	10.2	1,762.7	1,762.8	0.1
GZ	41.970	289	2106	10.7	1,763.5	1,764.2	0.7
HA	42.08	450	4,114	5.5	1,767.6	1,766.6	1.0
HB	42.17	205	2,307	9.8	1,767.8	1,766.9	0.9
HC	42.27	175	2,039	11.0	1,768.8	1,767.9	0.9
HD	42.35	425	5,034	4.5	1,770.8	1,769.8	1.0
HE	42.49	305	3,382	6.7	1,771.5	1,770.5	1.0
HF	42.59	180	2,075	10.8	1,771.5	1,770.8	0.7
HG	42.74	410	2,739	8.2	1,773.4	1,772.4	1.0
HH	42.86	235	2,961	7.6	1,774.9	1,774.3	0.6
HI	42.96	220	2,555	8.8	1,775.5	1,774.8	0.7
HJ	43.06	300	3,175	7.1	1,775.5	1,775.5	1.0
HK	43.13	145	1,904	11.8	1,776.5	1,775.5	1.0
HL	43.27	210	2,545	8.8	1,779.2	1,778.2	1.0
HM	43.36	205	2,367	9.5	1,780.0	1,779.1	0.9
HN	43.44	200	2,035	11.1	1,780.6	1,779.6	1.0

[1] Miles Above Confluence With Columbia River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA
(Unincorporated Areas)

FLOODWAY DATA

WENATCHEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	DIFFERENCE (FT)
Wenatchee River (continued)							
HO	43.54	210	2,000	11.3	1,782.5	1,782.1	0.4
HP	43.65	290	2,631	8.6	1,785.0	1,784.3	0.7
HQ	43.73	190	2,044	11.0	1,785.6	1,785.1	0.5
HR	43.80	255	2,800	8.0	1,787.4	1,787.0	0.4
HS	43.89	190	2,104	10.7	1,787.7	1,787.4	0.3
HT	44.02	220	2,181	10.3	1,789.5	1,789.2	0.3
HU	44.11	180	3,153	7.1	1,791.0	1,790.9	0.1
HV	44.21	200	2,391	9.4	1,792.8	1,792.6	0.2
HW	44.33	185	1,983	11.4	1,794.0	1,793.8	0.2
HX	44.41	175	2,132	10.6	1,795.9	1,795.3	0.2
HY	44.50	170	2,120	10.6	1,796.7	1,796.4	0.3
HZ	44.58	195	2,541	8.9	1,798.2	1,797.3	0.9
IA	44.69	185	2,183	10.3	1,799.7	1,799.2	0.5
IB	44.79	225	3,141	7.2	1,801.6	1,800.7	0.9
IC	44.90	175	2,052	11.0	1,801.8	1,800.9	0.9
ID	45.01	260	2,858	7.9	1,803.9	1,803.2	0.7
IE	45.13	220	2,340	9.6	1,804.7	1,804.3	0.4
IF	45.24	200	1,932	11.6	1,805.7	1,804.8	0.9
IG	45.35	210	2,622	8.6	1,808.5	1,808.2	0.3
IH	45.46	210	2,478	9.1	1,809.3	1,809.1	0.2
II	45.56	195	2,086	10.8	1,810.2	1,809.8	0.4
IJ	45.65	190	2,114	10.6	1,811.6	1,811.2	0.4
IK	45.76	180	2,128	10.6	1,813.0	1,812.7	0.4
IL	45.87	230	3,124	7.2	1,815.0	1,814.4	0.6
IM	45.98	180	2,122	10.6	1,815.2	1,814.6	0.6

[1] Miles Above Confluence With Columbia River

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	DIFFERENCE (FT)
Wenatchee River (continued)							
IN	46.13	155	1,858	12.1	1,817.0	1,816.7	0.3
IO	46.19	170	2,100	10.7	1,818.6	1,817.8	0.8
IP	46.21	190	2,681	8.4	1,820.5	1,820.1	0.4
IQ	46.30	190	2,325	9.7	1,821.1	1,820.7	4.4
IR	46.40	155	2,048	11.0	1,822.0	1,821.6	0.4
IS	46.42	160	2,101	10.7	1,823.1	1,822.4	0.7
IT	46.61	285	1,903	11.8	1,825.9	1,825.0	0.9
IU	46.82	265	2,481	9.1	1,813.2	1,831.2	0.0
IV	47.04	310	2,959	7.6	7,833.7	1,833.3	0.4
IW	47.25	260	2,033	11.1	1,835.9	1,835.7	0.2
IX	47.50	160	1,699	13.2	1,841.4	1,841.1	0.3
IY	47.71	195	2,494	9.0	1,845.9	1,845.4	0.5
IZ	47.92	205	2,211	10.2	1,848.1	1,847.4	0.7
JA	48.11	180	2,128	10.6	1,850.6	1,850.3	0.3
JB	48.35	220	2,838	7.9	1,854.8	1,854.0	0.8
JC	48.70	175	1,894	8.9	1,856.3	1,855.6	0.7
JD	48.96	310	3,103	5.4	1,858.7	1,858.3	0.4
JE	49.19	205	2,528	6.6	1,859.7	1,859.3	0.4
JF	49.56	210	2,688	6.3	1,861.4	1,861.1	0.3
JG	49.84	160	2,088	8.0	1,862.6	1,862.2	0.4
JH	50.02	255	3,211	5.2	1,864.0	1,863.5	0.5
JI	50.24	200	2,455	6.8	1,864.6	1,864.0	0.6
JJ	50.43	150	2,043	8.2	1,865.6	1,864.7	0.9
JK	50.69	215	2,985	5.6	1,867.3	1,866.3	1.0
JL	50.90	220	2,769	6.1	1,867.9	1,866.9	1.0

[1] Miles Above Confluence With Columbia River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA
(Unincorporated Areas)

FLOODWAY DATA

WENATCHEE RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	DIFFERENCE (FT.)
Wenatchee River (continued)							
JM	51.10[1]	605	5,330	3.2	1,868.9	1,867.9	1.0
JN	51.37[1]	540	5,796	2.9	1,869.6	1,868.6	1.0
JO	51.54[1]	200	2,774	6.0	1,869.8	1,868.8	1.0
JP	51.71[1]	185	2,653	6.3	1,870.4	1,869.5	0.9
JQ	51.94[1]	450	5,096	3.3	1,871.4	1,870.4	1.0
JR	52.11[1]	1,465	13,045	1.3	1,871.8	1,870.8	1.0
JS	52.30[1]	1,110	9,506	1.8	1,872.0	1,871.0	1.0
JT	52.65[1]	1,400	13,715	1.2	1,872.4	1,871.4	1.0
JU	52.91[1]	1,575	11,332	1.5	1,872.6	1,871.6	1.0
JV	53.11[1]	2,000	17,288	1.0	1,872.8	1,871.8	1.0
JW	53.30[1]	2,090	15,020	1.1	1,873.0	1,872.0	1.0
JX	53.39[1]	670	5,691	3.0	1,873.0	1,872.0	1.0
JY	53.56[1]	170	1,930	8.7	1,873.1	1,872.2	0.9
JZ	53.78[1]	160	1,768	9.5	1,875.2	1,874.5	0.7
KA	53.98[1]	560	5,408	3.1	1,877.5	1,876.6	0.9
KB	54.06[1]	170	1,947	8.6	1,877.6	1,876.6	1.0
KC	54.11[1]	360	5,242	3.2	1,878.9	1,878.2	0.7
KD	54.34[1]	210	3,064	4.2	1,879.1	1,878.4	0.7
KE	54.59[1]	425	7,372	1.8	1,879.5	1,878.8	0.7
Wenatchee River (Split Floodway)							
A	0.080[2]	350	1,889	3.4	1,749.8	1,750.1	0.3
B	0.160[2]	320	1,519	4.2	1,751.0	1,751.9	0.9
C	0.230[2]	360	1,552	4.1	1,753.6	1,754.5	0.9
D	0.300[2]	380	1,572	4.1	1,757.2	1,757.3	0.1

[1] Miles Above Confluence With Columbia River
[2] Distance Above Split From Main Channel Wenatchee River At Section GC

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA
(Unincorporated Areas)

FLOODWAY DATA

WENATCHEE RIVER/Wenatchee River (Split Floodway)

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Mission Creek							
A	0.02	80	291	9.0	778.2	778.2	0.0
B	0.08	80	214	12.1	780.4	780.4	0.0
C	0.11	50	259	10.0	782.7	782.7	0.0
D	0.14	68	536	4.9	786.4	786.4	0.0
E	0.17	59	339	7.7	786.7	786.4	0.3
F	0.19	60	449	5.8	787.1	786.6	0.5
G	0.21	115	560	4.6	788.3	787.3	1.0
H	0.28	330	492	5.3	789.2	788.2	1.0
I	0.36	280	651	4.0	794.5	793.5	1.0
J	0.44	39	198	12.9	799.2	799.2	0.0
K	0.46	65	304	8.6	802.4	801.8	0.6
L	0.53	66	357	7.3	805.4	804.6	0.8
M	0.60	46	220	11.8	809.0	809.0	0.0
N	0.62	49	290	9.0	811.5	811.3	0.2
O	0.65	48	301	8.6	812.5	812.2	0.3
P	0.77	46	238	10.9	818.9	818.4	0.5
Q	0.83	76	287	9.1	824.8	824.2	0.6
R	0.90	85	374	7.0	830.7	829.7	1.0
S	0.93	58	460	5.7	833.1	833.0	0.1

[1]Miles Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

MISSION CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Mission Creek (continued)							
T	0.96	99	301	8.6	836.7	836.7	0.0
U	0.98	199	550	4.7	838.7	837.8	0.9
V	1.01	81	313	8.3	839.5	838.8	0.7
W	1.03	76	384	6.8	842.7	842.7	0.0
X	1.12	130	390	6.7	846.1	845.8	0.3
Y	1.18	219	493	5.3	850.0	849.0	1.0
Z	1.22	115	459	5.7	854.1	853.1	1.0
AA	1.29	107	326	8.0	857.5	856.6	0.9
AB	1.40	310	609	4.3	863.0	862.0	1.0
AC	1.49	73	256	10.2	871.9	871.9	0.0
AD	1.59	88	348	7.5	878.5	877.5	1.0
AE	1.64	51	234	11.1	881.8	881.8	0.0
AF	1.66	111	785	3.3	889.5	889.5	0.0
AG	1.77	80	323	8.0	893.5	893.5	0.0
AH	1.90	144	570	4.6	900.2	899.2	1.0
AI	1.99	76	302	8.6	907.3	907.3	0.0
AJ	2.09	68	298	8.7	913.3	913.3	0.0
AK	2.27	80	347	7.5	932.3	931.4	0.9

[1]Miles Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

MISSION CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Mission Creek (continued)							
AL	2.38	82	329	7.9	940.2	940.2	0.0
AM	2.49	88	358	7.3	948.3	947.3	1.0
AN	2.63	112	397	6.5	957.0	956.4	0.6
AO	2.72	49	286	9.1	964.3	964.3	0.0
AP	2.84	49	281	9.3	973.2	973.2	0.0
AQ	2.95	48	259	10.0	980.1	980.1	0.0
AR	3.08	119	393	6.6	988.7	987.8	0.9
AS	3.21	52	281	9.3	999.2	998.2	1.0
AT	3.35	56	285	9.1	1,009.5	1,009.3	0.2
AU	3.48	60	292	8.9	1,020.5	1,020.3	0.2
AV	3.59	48	260	10.0	1,029.8	1,029.8	0.0
AW	3.74	41	263	9.9	1,045.9	1,045.6	0.3
AX	3.87	43	245	10.6	1,056.2	1,055.9	0.3
AY	4.02	134	401	6.5	1,072.3	1,071.3	1.0
AZ	4.14	56	267	9.7	1,077.6	1,077.1	0.5
BA	4.27	64	294	8.8	1,091.0	1,090.8	0.2
BB	4.36	96	350	7.4	1,098.9	1,098.9	0.0
BC	4.39	118	491	5.3	1,103.8	1,102.8	1.0

[1] Miles Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

MISSION CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Mission Creek (continued)							
BD	4.50	101	368	7.1	1,107.3	1,107.2	0.1
BE	4.62	68	290	9.0	1,117.1	1,117.1	0.0
BF	4.70	84	338	7.7	1,123.5	1,122.9	0.6
BG	4.82	95	340	7.6	1,131.5	1,130.5	1.0
BH	4.95	62	290	9.0	1,139.7	1,139.7	0.0
BI	5.03	77	333	7.8	1,146.8	1,146.7	0.1
Peshastin Creek							
A	0.04	86	509	7.4	978.3[2]	978.3[2]	0.0
B	0.15	76	324	11.7	988.3	988.3	0.0
C	0.26	79	327	11.6	997.6	997.6	0.0
D	0.38	80	334	11.3	1,008.6	1,008.4	0.2
E	0.40	76	351	10.8	1,011.9	1,011.9	0.0
F	0.52	75	369	10.3	1,020.8	1,020.2	0.6
G	0.64	66	330	11.5	1,032.6	1,032.6	0.0
H	0.70	86	404	9.4	1,036.5	1,036.5	0.0
I	0.88	77	409	9.3	1,045.6	1,044.9	0.7
J	1.05	74	340	11.1	1,057.1	1,057.0	0.1

[1]Miles Above Confluence With Wenatchee River [2]Elevation Computed Without Consideration of Backwater Effects of Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

MISSION CREEK-PESHASTIN CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Peshastin Creek (continued)							
K	1.26	80	372	10.2	1,074.9	1,074.9	0.0
L	1.38	74	327	11.6	1,085.8	1,085.3	0.5
M	1.51	176	566	6.7	1,095.3	1,094.8	0.5
N	1.53	57	379	10.0	1,095.9	1,095.5	0.4
O	1.72	88	361	10.5	1,108.1	1,108.1	0.0
P	1.90	70	331	11.5	1,123.1	1,123.1	0.0
Q	2.02	66	337	11.2	1,130.1	1,130.1	0.0
R	2.04	67	440	8.6	1,132.1	1,131.6	0.5
S	2.24	64	344	11.0	1,145.7	1,145.7	0.0
T	2.42	72	332	11.4	1,159.6	1,159.5	0.1
U	2.57	74	319	11.9	1,173.1	1,173.1	0.0
V	2.74	77	334	11.3	1,187.4	1,187.3	0.1
W	2.90	82	330	11.5	1,200.6	1,200.6	0.0
X	3.07	94	382	9.9	1,215.0	1,214.0	1.0
Y	3.23	120	401	9.5	1,225.9	1,225.6	0.3
Z	3.43	90	345	11.0	1,240.0	1,239.3	0.7
AA	3.61	55	347	10.9	1,253.1	1,252.5	0.6

[1]Miles Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

PESHASTIN CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Peshastin Creek (continued)							
AB	3.78	56	319	11.9	1,263.7	1,263.1	0.6
AC	3.94	70	313	12.1	1,276.6	1,276.6	0.0
AD	4.04	69	337	11.2	1,286.0	1,285.8	0.2
AE	4.06	72	409	9.3	1,288.5	1,288.5	0.0
AF	4.18	66	318	11.9	1,296.7	1,296.7	0.0
AG	4.30	91	444	8.5	1,305.5	1,304.7	0.8
AH	4.61	70	355	10.7	1,328.3	1,327.8	0.5
AI	4.76	53	347	10.9	1,340.0	1,339.1	0.9
AJ	4.90	75	330	11.5	1,351.2	1,351.1	0.1
AK	5.05	90	426	8.9	1,362.9	1,362.0	0.9
AL	5.18	79	766	5.0	1,380.0	1,379.0	1.0
AM	5.20	110	849	4.5	1,384.5	1,384.5	0.0
AN	5.31	74	354	10.7	1,384.6	1,384.5	0.1
Icicle Creek							
A	0.58	405	2,976	4.2	1,111.4[2]	1,111.0[2]	0.4
B	1.00	860	3,646	3.4	1,113.3[2]	1,112.7[2]	0.6

[1]Miles Above Confluence With Wenatchee River [2]Elevations Computed Without Consideration of Ice-Jam Effects

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

PESHASTIN CREEK-ICICLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Icicle Creek (continued)							
C	1.48	1,800	6,452	1.9	1,115.0[2]	1,114.1[2]	0.9
D	2.20	120	1,388	8.9	1,117.7[2]	1,116.8[2]	0.9
E	2.44	480	3,228	3.8	1,120.3[2]	1,119.3[2]	1.0
F	2.50	120	1,714	7.2	1,121.2[2]	1,120.8[2]	0.4
G	2.78	115	1,540	8.0	1,122.7[2]	1,121.7[2]	1.0
H	2.93	200	2,289	5.4	1,123.5[2]	1,122.5[2]	1.0
Chumstick Creek							
A	0.03	37	181	9.5	1,081.9	1,081.5	0.4
B	0.14	24	147	11.7	1,108.3	1,108.0	0.3
C	0.27	29	183	9.4	1,119.1	1,118.5	0.6
D	0.33	24	221	7.8	1,125.0	1,124.0	1.0
E	0.40	51	360	4.8	1,127.8	1,126.8	1.0
F	0.47	21	139	12.4	1,129.6	1,129.3	0.3
G	0.49	55	482	3.6	1,134.9	1,134.9	0.0
H	0.53	60	356	4.8	1,135.3	1,135.3	0.0
I	0.59	52	230	7.5	1,138.2	1,137.8	0.4

[1]Miles Above Confluence With Wenatchee River [2]Elevations Computed Without Consideration of Ice-Jam Effects

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ICICLE CREEK-CHUMSTICK CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Chumstick Creek (continued)							
J	0.61	104	817	2.1	1,142.2	1,141.2	1.0
K	0.70	85	455	3.8	1,142.7	1,141.7	1.0
L	0.80	55	243	7.1	1,148.0	1,147.7	0.3
M	0.83	140	961	1.8	1,152.7	1,151.7	1.0
N	0.93	31	185	9.3	1,152.4	1,152.4	0.0
O	1.06	53	171	10.1	1,158.7	1,157.7	1.0
P	1.20	34	177	9.7	1,169.7	1,169.5	0.2
Q	1.23	52	304	5.7	1,172.8	1,171.8	1.0
R	1.37	24	166	10.4	1,178.8	1,178.1	0.7
S	1.50	51	263	6.5	1,185.7	1,184.7	1.0
T	1.63	31	174	9.9	1,192.2	1,191.9	0.3
U	1.75	21	150	11.5	1,199.8	1,198.9	0.9
V	1.83	26	152	11.3	1,206.7	1,206.5	0.2
W	1.85	86	550	3.1	1,209.3	1,208.5	0.8
X	2.00	31	178	9.7	1,213.4	1,213.1	0.3
Y	2.10	15	121	14.2	1,219.1	1,218.1	1.0
Z	2.21	18	112	10.7	1,225.9	1,225.3	0.6

[1]Miles Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

CHUMSTICK CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Chumstick Creek (continued)							
AA	2.24	27	227	5.3	1,229.9	1,228.9	1.0
AB	2.35	26	134	9.0	1,234.9	1,234.2	0.7
AC	2.46	40	159	7.5	1,239.4	1,239.2	0.2
AD	2.56	32	169	7.1	1,246.9	1,245.9	1.0
AE	2.59	90	638	1.9	1,249.5	1,249.4	0.1
AF	2.64	27	128	9.4	1,251.1	1,251.1	0.0
AG	2.68	83	289	4.2	1,253.9	1,253.0	0.9
AH	2.70	74	385	3.1	1,255.3	1,254.3	1.0
AI	2.83	37	143	8.4	1,258.7	1,258.7	0.0
AJ	2.89	27	140	8.6	1,262.8	1,262.2	0.6
AK	2.91	61	381	3.2	1,266.7	1,266.7	0.0
AL	2.97	36	128	9.4	1,267.2	1,267.0	0.2
AM	3.04	29	152	7.9	1,270.6	1,269.6	1.0
AN	3.06	33	231	5.2	1,274.1	1,274.1	0.0
AO	3.20	30	145	8.3	1,276.6	1,276.1	0.5
AP	3.34	34	184	5.1	1,285.4	1,284.4	1.0
AQ	3.43	27	106	8.8	1,291.7	1,291.2	0.5

[1]Miles Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

CHUMSTICK CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Chumstick Creek (continued)							
AR	3.50	25	130	7.2	1,297.1	1,296.1	1.0
AS	3.67	20	96	9.7	1,304.9	1,304.4	0.5
AT	3.80	31	126	7.4	1,312.3	1,311.7	0.6
AU	3.95	61	259	3.6	1,320.0	1,319.3	0.7
AV	4.14	26	133	7.0	1,328.5	1,327.5	1.0
AW	4.28	37	176	5.3	1,334.0	1,333.0	1.0
AX	4.37	31	119	7.8	1,337.7	1,336.9	0.8
AY	4.44	20	103	9.0	1,340.8	1,339.8	1.0
AZ	4.46	60	308	3.0	1,343.4	1,342.4	1.0
BA	4.58	40	161	5.8	1,345.6	1,344.6	1.0
BB	4.71	15	88	10.6	1,351.9	1,351.1	0.8
BC	4.86	24	130	7.2	1,359.9	1,358.9	1.0
BD	4.95	34	171	5.4	1,364.9	1,363.9	1.0
BE	4.98	108	617	1.5	1,368.1	1,368.1	0.0
BF	5.14	15	83	11.2	1,372.4	1,372.2	0.2
BG	5.25	19	94	9.9	1,378.3	1,377.9	0.4
BH	5.35	25	92	10.1	1,386.2	1,385.2	1.0
BI	5.48	22	93	10.0	1,391.6	1,391.1	0.5

[1]Miles Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

CHUMSTICK CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Chumstick Creek (continued)							
BJ	5.58	18	96	9.7	1,398.4	1,397.4	1.0
BK	5.71	33	111	8.4	1,403.4	1,402.8	0.6
BL	5.73	56	258	3.6	1,406.2	1,406.2	0.0
BM	5.77	20	153	6.1	1,409.3	1,408.3	1.0
BN	5.80	65	371	2.5	1,411.2	1,410.2	1.0
BO	5.90	46	136	6.8	1,414.1	1,413.9	0.2
BP	6.00	36	180	5.2	1,418.2	1,417.2	1.0
BQ	6.02	46	180	5.2	1,418.7	1,418.1	0.6
BR	6.04	69	318	2.9	1,419.7	1,418.7	1.0
BS	6.06	25	116	8.0	1,419.7	1,418.7	1.0
BT	6.11	30	99	9.4	1,422.1	1,421.7	0.4
BU	6.19	17	106	8.8	1,426.8	1,425.8	1.0
BV	6.21	19	101	9.2	1,427.9	1,426.9	1.0
BW	6.35	33	126	7.4	1,435.1	1,434.8	0.3
BX	6.46	42	147	6.3	1,441.0	1,440.6	0.4
BY	6.57	40	122	7.6	1,447.5	1,447.0	0.5
BZ	6.59	273	814	0.9	1,452.1	1,452.1	0.0

[1]Miles Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

CHUMSTICK CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Chumstick Creek (continued)							
CA	6.70	30	104	8.9	1,456.1	1,456.0	0.1
CB	6.81	22	88	8.8	1,462.6	1,461.6	1.0
CC	6.83	32	93	8.3	1,464.9	1,464.8	0.1
CD	6.89	19	87	10.7	1,470.9	1,470.9	0.0
CE	6.91	25	125	7.4	1,474.3	1,473.3	1.0
CF	6.95	90	150	8.8	1,475.7	1,474.7	1.0
CG	7.08	12	77	12.1	1,487.7	1,486.7	1.0
CH	7.16	20	108	8.6	1,493.4	1,492.4	1.0
CI	7.23	11	65	14.3	1,498.7	1,498.2	0.5
CJ	7.33	15	78	9.9	1,507.9	1,507.5	0.4
CK	7.47	15	86	10.8	1,517.0	1,516.0	1.0
CL	7.56	29	98	9.5	1,522.0	1,521.0	1.0
CM	7.61	15	89	10.4	1,523.4	1,522.8	0.6
CN	7.67	12	65	14.3	1,528.1	1,527.8	0.3
CO	7.76	20	108	8.6	1,534.7	1,533.7	1.0
CP	7.88	32	139	6.7	1,538.5	1,537.5	1.0
CQ	8.02	19	88	8.8	1,546.4	1,545.4	1.0
CR	8.03	54	229	4.0	1,547.0	1,546.8	0.2

[1]Miles Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

CHUMSTICK CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Chumstick Creek (continued)							
CS	8.07	39	117	7.9	1,549.2	1,548.6	0.6
CT	8.24	24	109	8.5	1,557.6	1,556.6	1.0
CU	8.33	21	83	11.2	1,562.0	1,561.4	0.6
CV	8.35	51	285	3.3	1,566.0	1,565.1	0.9
CW	8.44	30	109	8.5	1,568.0	1,567.6	0.4
CX	8.62	27	117	7.9	1,578.1	1,577.5	0.6
CY	8.77	19	87	10.7	1,584.8	1,583.9	0.9
CZ	8.84	19	76	10.1	1,589.3	1,588.3	1.0
DA	8.92	27	91	10.2	1,596.3	1,595.7	0.6
DB	8.98	25	135	6.9	1,600.4	1,599.4	1.0
DC	9.01	29	162	5.7	1,602.7	1,602.4	0.3
DD	9.14	36	122	7.6	1,609.8	1,609.0	0.8
Chiwawa River							
A	0.07	65	501	14.4	1,855.3	1,855.1	0.7
B	0.24	120	1,008	7.1	1,862.5	1,861.5	1.0
C	0.40	560	2,715	2.7	1,864.8	1,864.0	0.8
D	0.57	110	564	12.8	1,867.6	1,867.6	0.0

[1]Miles Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

CHUMSTICK CREEK-CHIWAWA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Chiwawa River (continued)							
E	0.73	100	689	10.4	1,875.8	1,875.2	0.6
F	0.90	95	706	10.2	1,880.8	1,879.9	0.9
G	1.20	85	513	14.0	1,893.3	1,892.4	0.9
H	1.39	300	1,203	6.0	1,902.0	1,901.0	1.0
I	1.60	185	675	10.7	1,908.3	1,908.0	0.3
J	1.76	210	823	8.7	1,915.2	1,914.2	1.0
K	2.00	145	683	10.5	1,923.0	1,923.0	0.0
L	2.15	140	605	11.9	1,927.6	1,927.6	0.0
M	2.42	115	731	9.8	1,940.0	1,939.8	0.2
N	2.61	115	652	11.0	1,946.4	1,946.2	0.2
O	2.79	85	634	11.4	1,953.0	1,952.5	0.5
P	3.08	85	626	11.5	1,962.8	1,962.2	0.6
Q	3.32	95	534	13.5	1,975.2	1,975.2	0.0
R	3.67	100	853	8.4	1,986.8	1,986.1	0.7
S	3.93	95	532	13.5	1,993.3	1,993.3	0.0
T	4.15	110	729	9.9	2,003.9	2,003.0	0.9
U	4.39	90	806	8.9	2,009.5	2,009.2	0.3

[1] Miles Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

CHIWAWA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	DIFFERENCE (FT)
Nason Creek							
A	22,250	180	919	7.2	1,957.6	1,958.6	1.0
B	22,812	313	892	7.4	1,961.5	1,961.6	0.1
C	22,848	339	1565	4.2	1,962.9	1,963.7	0.8
D	23,030	476	3020	2.2	1,963.7	1,964.6	0.9
E	23,770	166	604	10.9	1,966.8	1,967.4	0.6
F	24,760	249	921	7.2	1,976.5	1,977.5	1.0
G	26,100	119	542	12.2	1,993.7	1,993.7	0.0
H	26,770	93	728	9.0	1,999.1	2,000.1	1.0
I	27,990	116	536	12.3	2,012.5	2,012.5	0.0
J	29,680	229	1146	5.7	2,027.8	2,028.8	1.0
K	31,020	190	666	9.3	2,038.5	2,038.8	0.3
L	32,370	93	631	9.8	2,052.6	2,052.6	0.0
M	33,120	150	542	11.4	2,066.2	2,066.2	0.0
N	33,540	457	858	7.2	2,072.8	2,072.8	0.0
O	34,190	226	793	7.8	2,078.2	2,078.2	0.0
P	34,700	141	647	9.5	2,082.3	2,082.4	0.1
Q	35,650	91	635	9.7	2,089.9	2,090.3	0.4
R	36,820	145	723	8.5	2,098.3	2,098.4	0.1
S	37,840	98	674	9.2	2,104.4	2,104.6	0.2
T	38,860	130	875	7.0	2,109.7	2,109.7	0.0
U	40,100	124	917	6.7	2,113.7	2,114.1	0.4
V	40,959	79	616	10.0	2,117.2	2,117.3	0.1
W	41,920	114	957	6.4	2,121.3	2,122.2	0.9
X	43,010	336	1500	4.1	2,124.4	2,125.0	0.6
Y	43,890	151	1088	5.7	2,126.2	2,127.2	1.0
Z	45,240	101	581	10.3	2,131.6	2,131.9	0.3

[1] Feet Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA
(Unincorporated Areas)

FLOODWAY DATA

NASON CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	DIFFERENCE (FT.)
Nason Creek (Continued)							
AA	46,690	151	1,199	5.0	2,137.9	2,138.0	0.1
AB	47,230	81	772	7.7	2,138.7	2,138.8	0.1
AC	47,240	107	913	6.5	2,139.1	2,139.2	0.1
AD	47,566	78	766	7.8	2,139.9	2,140.0	0.1
AE	48,020	270	1,945	2.7	2,141.2	2,141.5	0.3
AF	49,340	329	1,537	3.5	2,142.0	2,142.8	0.8
AG	50,630	103	845	6.3	2,144.2	2,145.2	1.0
AH	52,250	375	2,005	2.7	2,147.8	2,148.3	0.5
AI	53,780	69	563	8.9	2,150.2	2,151.1	0.9
AJ	55,240	102	826	6.1	2,156.6	2,156.9	0.3
AK	56,950	161	996	5.0	2,160.6	2,160.8	0.2
AL	57,990	123	843	5.9	2,162.9	2,163.1	0.2
AM	59,122	77	560	8.9	2,166.2	2,166.4	0.2
AN	59,450	84	589	8.5	2,168.1	2,168.2	0.1
AO	59,930	70	582	8.6	2,170.4	2,170.5	0.1
AP	60,710	315	1,636	2.9	2,172.4	2,172.8	0.4
AQ	62,410	70	727	6.6	2,177.8	2,178.5	0.7
AR	63,440	127	985	4.9	2,180.0	2,181.0	1.0
AS	65,010	136	821	5.9	2,184.0	2,184.6	0.6
AT	66,290	120	811	5.9	2,188.4	2,188.7	0.3
AU	67,070	99	642	7.5	2,191.3	2,191.6	0.3
AV	68,760	66	560	8.6	2,199.2	2,200.0	0.9
AW	69,860	71	477	10.0	2,206.9	2,207.3	0.4
AX	70,965	78	486	9.5	2,229.3	2,229.3	0.0

[1] Feet Above Confluence With Wenatchee River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA
(Unincorporated Areas)

FLOODWAY DATA

NASON CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION[2]		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Entiat River							
A	0	295	3,905	1.5	712.0	712.0	0.0
B	100	290	3,054	2.9	712.0	712.0	0.0
C	1,000	365	2,572	3.5	712.3	712.3	0.0
D	1,950	360	2,655	3.4	712.9	712.9	0.0
E	2,750	375	2,371	3.8	713.4	713.4	0.0
F	3,950	245	1,175	7.8	714.8	714.8	0.0
G	5,350	105	711	12.5	727.3	727.2	0.1
H	6,450	160	920	9.7	741.2	741.2	0.0
I	6,600	145	774	11.5	743.8	743.8	0.0
J	6,650	145	923	9.6	745.2	745.1	0.1
K	8,100	150	773	11.5	759.3	758.8	0.5
L	9,200	345	1,464	6.1	769.3	768.3	1.0
M	10,500	110	836	10.7	776.0	775.3	0.7
N	11,430	265	1,167	7.6	783.8	782.8	1.0
O	12,250	170	803	11.1	790.9	790.9	0.0
P	13,325	170	831	10.7	801.9	801.9	0.0
Q	14,150	160	923	9.7	809.4	809.4	0.0
R	14,980	110	797	11.2	817.1	817.1	0.0
S	15,165	125	972	9.2	819.6	819.6	0.0

[1]Feet Above Confluence With Columbia River [2]Elevations Computed Without Consideration of Ice Jam Effects

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ENTIAT RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION[2]		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Entiat River (continued)							
T	15,265	125	1,023	8.7	820.1	820.1	0.0
U	15,575	100	807	11.0	823.9	823.9	0.0
V	16,430	120	890	10.0	831.4	830.8	-0.6
W	17,425	160	966	9.2	840.8	840.2	-0.6
X	18,725	125	829	10.7	853.7	853.7	0.0
Y	19,975	130	802	11.1	868.9	868.9	0.1
Z	20,370	125	780	11.4	874.7	874.7	0.0
AA	21,400	150	902	9.9	886.5	886.3	-0.2
AB	21,900	115	684	13.0	887.9	887.9	0.0
AC	22,300	130	929	9.6	891.7	891.7	0.0
AD	22,100	120	685	13.0	892.0	892.0	0.0
AE	23,925	200	884	10.1	900.4	900.4	0.1
AF	24,425	240	1,271	7.0	916.9	916.9	0.0
AG	25,575	140	866	10.3	927.5	927.5	0.0
AH	27,075	330	1,529	5.8	943.2	942.4	-0.8
AI	28,400	100	623	14.3	956.7	956.7	0.0
AJ	29,125	205	1,215	7.3	967.1	966.4	-0.7
AK	29,725	135	704	11.8	969.2	969.0	-0.3

[1]Feet Above confluence with Columbia River [2]Elevations computed without consideration of backwater effects

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ENTIAT RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION[2]		
CROSS SECTION	DISTANCE[1]	WIDTH (FT)	SECTION AREA (SQ FT)	MEAN VELOCITY (FPS)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT)
Entiat River (continued)							
AL	30,550	295	1,430	5.8	981.7	980.7	1.0
AM	31,325	245	800	10.4	991.6	991.6	0.0
AN	32,950	130	768	10.8	1,017.4	1,016.4	1.0
AO	34,350	330	1,076	7.7	1,032.8	1,031.8	1.0
AP	35,725	125	794	10.5	1,046.2	1,045.8	0.4
AQ	36,700	110	973	8.5	1,053.9	1,053.1	0.8
AR	38,225	150	735	11.3	1,066.6	1,066.4	0.2
AS	39,150	130	843	9.6	1,079.0	1,079.0	0.0
AT	40,725	150	919	9.0	1,092.8	1,092.7	0.1
AU	41,625	95	585	14.2	1,104.2	1,103.8	0.4
AV	42,725	180	1,175	7.0	1,115.9	1,115.2	0.7
AW	43,650	135	657	12.6	1,126.4	1,126.4	0.0
AX	44,825	150	911	9.1	1,143.1	1,142.6	0.5
AY	46,100	80	585	14.2	1,156.2	1,155.9	0.3
AZ	46,200	80	962	8.6	1,159.1	1,159.1	0.0
BA	47,575	130	701	11.8	1,172.5	1,172.5	0.0
BB	48,725	140	888	9.3	1,184.5	1,184.5	0.0
BC	49,925	135	776	10.7	1,194.2	1,194.2	0.0

[1] Feet Above Confluence With Columbia River [2] Elevations Computed Without Consideration of Levees

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ENTIAT RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Entiat River (Continued)							
BD	50,900	110	848	9.8	1,203.5	1,203.5	0.0
BE	52,125	120	801	10.4	1,214.2	1,214.1	0.1
BF	52,850	115	921	9.0	1,220.6	1,220.5	0.1
BG	53,900	180	1,111	7.5	1,227.9	1,227.8	0.1
BH	55,175	110	636	13.0	1,238.9	1,238.9	0.0
BI	55,750	105	887	9.4	1,244.3	1,244.2	0.1
BJ	56,325	115	780	9.5	1,248.2	1,247.9	0.3
BK	56,375	95	672	11.0	1,248.4	1,248.1	0.3
BL	56,450	120	906	8.2	1,250.4	1,250.4	0.0
BM	57,300	115	725	10.2	1,256.0	1,255.2	0.8
BN	58,825	85	677	10.9	1,271.5	1,271.5	0.0
BO	59,800	120	817	9.1	1,279.8	1,279.3	0.5
BP	60,850	110	726	10.2	1,289.0	1,289.0	0.0
BQ	61,975	110	817	9.1	1,298.5	1,298.3	0.2
BR	62,525	100	684	10.8	1,302.8	1,302.6	0.2
BS	63,800	115	898	8.2	1,313.1	1,313.0	0.1
BT	64,575	105	562	13.2	1,320.1	1,320.1	0.0
BU	65,650	130	868	8.5	1,334.0	1,333.9	.1

[1]Feet Above Confluence With Columbia River [2]Elevations Computed Without Consideration of Ice-Jam Effects

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ENTIAT RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION[2]		
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Entiat River (continued)							
BV	66,325	115	703	10.5	1,338.9	1,338.8	0.1
BW	67,350	109	692	10.7	1,350.2	1,350.0	0.2
BX	68,350	115	686	10.8	1,358.7	1,358.7	0.0
BY	69,075	70	583	12.7	1,366.5	1,366.4	0.1
BZ	70,275	110	861	8.6	1,378.4	1,378.4	0.0
CA	71,050	80	681	10.9	1,383.9	1,383.9	0.0
CB	72,225	65	520	14.3	1,396.1	1,396.1	0.0
CC	73,375	115	912	8.1	1,409.1	1,409.1	0.0
CD	74,175	65	483	15.3	1,419.6	1,419.6	0.0
CE	75,225	125	862	8.6	1,429.1	1,429.1	0.0
CF	75,975	105	707	10.5	1,434.7	1,434.7	0.0
CG	77,125	135	791	9.4	1,446.4	1,446.4	0.0
CH	78,225	135	699	10.6	1,459.4	1,459.4	0.0
CI	78,950	135	872	8.5	1,467.2	1,467.2	0.0
CJ	79,825	110	641	10.8	1,474.7	1,474.7	0.0
CK	80,575	85	618	11.2	1,483.6	1,483.4	0.2
CL	81,825	110	652	10.6	1,498.1	1,497.7	0.4
CM	82,700	120	704	9.8	1,509.5	1,509.5	0.0

[1] Feet Above Confluence With Columbia River [2] Elevations Computed Without [illegible]

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ENTIAT RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION[2]		
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Entiat River (continued)							
CN	84,023	125	742	9.3	1,922.0	1,922.4	.4
CO	84,210	130	937	11.6	1,936.4	1,936.5	.1
CP	90,200	100	650	10.5	1,548.0	1,547.9	-.1
CQ	97,100	270	1,594	4.3	1,552.1	1,551.9	-.2
CR	98,250	350	1,100	5.3	1,553.4	1,552.9	-.5
CS	89,830	200	662	10.4	1,555.1	1,555.0	-.1
CT	91,125	310	1,952	4.3	1,559.0	1,558.4	-.6
CU	92,620	300	2,146	3.2	1,560.2	1,559.2	-1.0
CV	93,525	150	603	11.4	1,561.6	1,561.6	0.0
CW	94,500	870	3,975	1.7	1,563.6	1,562.8	-.8
CX	95,[illegible]	1[illegible]	1,029	6.7	1,565.1	1,564.1	-1.0
CY	96,575	140	1,002	6.9	1,567.5	1,566.7	-.8
CZ	97,650	230	1,214	5.7	1,569.4	1,568.4	-1.0
DA	98,450	95	694	7.2	1,571.0	1,571.0	.0
DB	99,375	460	2,378	2.9	1,575.8	1,575.0	-.8
DC	101,075	335	1,919	3.6	1,576.7	1,[illegible]75.7	1.[illegible]
DD	101,875	360	2,153	3.2	1,577.5	1,576.8	-.7
DE	103,925	830	3,480	2.0	1,579.0	1,[illegible]78.4	-.6

[1]Feet Above Confluence With Columbia River [2]Elevations Computed Without Consideration of Ice-Jam Effects

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ENTIAT RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Entiat River (continued)							
DF	104,400[1]	815	3,583	1.9	1,579.6[2]	1,579.0[2]	0.6
DG	105,425[1]	860	2,699	2.6	1,580.4[2]	1,579.8[2]	0.6
DH	106,325[1]	390	1,365	5.1	1,582.1[2]	1,581.4[2]	0.7
DI	107,525[1]	815	2,011	3.4	1,586.6[2]	1,585.7[2]	0.9
DJ	108,225[1]	420	1,520	4.5	1,588.5[2]	1,587.9[2]	0.6
DK	108,875[1]	330	1,692	4.1	1,589.7[2]	1,588.9[2]	0.8
DL	109,675[1]	260	1,113	6.2	1,590.8[2]	1,590.2[2]	0.6
DM	110,900[1]	320	1,415	4.9	1,594.7[2]	1,594.1[2]	0.6
Mad River							
A	820[3]	58	246	8.3	1,257.7	1,257.3	0.4
B	1,420[3]	50	227	8.8	1,264.3	1,264.3	0.0
C	1,480[3]	37	200	10.0	1,264.8	1,264.8	0.0
D	1,540[3]	52	245	8.2	1,266.1	1,266.1	0.0
E	1,900[3]	42	172	11.8	1,271.8	1,271.6	0.2
F	2,370[3]	35	197	10.3	1,280.2	1,280.0	0.2
G	2,720[3]	41	248	8.8	1,285.9	1,284.9	1.0
H	2,960[3]	43	249	8.0	1,287.2	1,287.2	0.0

[1]Feet Above Confluence With Columbia River [2]Elevations Computed Without Consideration of Ice-Jam Effects [3]Feet Above Confluence With Entiat River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

ENTIAT RIVER-MAD RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
Mad River (continued)							
I	3,010[1]	30	188	10.7	1,287.4	1,287.4	0.0
J	3,110[1]	37	165	12.1	1,290.3	1,290.3	0.0
K	3,640[1]	57	291	7.2	1,298.5	1,298.3	0.2
L	4,140[1]	36	164	12.2	1,305.2	1,305.2	0.0
Stehekin River							
A	0.15[2]	638	4,337	4.4	1,104.7	1,103.7	1.0
B	0.29[2]	699	4,720	4.1	1,106.2	1,105.4	0.8
C	0.38[2]	677	4,394	4.4	1,107.3	1,106.9	0.4
D	0.75[2]	454	2,751	7.0	1,113.6	1,113.3	0.3
E	0.97[2]	418	2,790	6.9	1,118.2	1,117.7	0.5
F	1.16[2]	582	1,938	9.9	1,123.2	1,123.0	0.2
G	1.39[2]	228	2,595	7.4	1,129.7	1,128.7	1.0
H	1.68[2]	950	4,775	4.0	1,132.3	1,131.8	0.5
I	1.78[2]	1,069	2,987	6.4	1,133.2	1,133.0	0.2
J	1.95[2]	665	3,062	5.8	1,137.2	1,136.2	1.0
K	2.29[2]	224	1,308	13.5	1,143.4	1,143.4	0.0
L	2.53[2]	460	2,660	7.8	1,152.3	1,152.1	0.2

[1]Feet Above Confluence With Entiat River [2]Miles Above Confluence With Lake Chelan

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

MAD RIVER-STEHEKIN RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	WITH FLOODWAY	WITHOUT FLOODWAY (FEET NGVD)	DIFFERENCE
Stehekin River (continued)							
M	2.80	1,500	2,875	6.2	1,157.2	1,157.2	0.0
N	2.97	2,070	2,767	6.4	1,164.3	1,164.3	0.0
O	3.26	2,600	6,840	2.6	1,171.0	1,171.0	0.0
P	3.47	549	1,812	9.8	1,177.8	1,177.8	0.0
Q	3.60	1,116	3,300	5.4	1,184.5	1,184.5	0.0
R	3.64	1,121	4,123	4.3	1,186.6	1,186.6	0.0
S	3.88	1,150[2]	2,348	7.5	1,193.0	1,193.0	0.0
T	4.09	900[2]	4,565	3.9	1,197.5	1,197.5	0.0
U	4.29	900	1,644	9.9	1,207.5	1,207.5	0.0
V	4.69	931	2,993	5.4	1,227.1	1,226.7	0.4
W	4.95	547	2,027	8.0	1,237.0	1,236.2	0.8

[1]Miles Above Confluence With Lake Chelan [2]This Width Does Not Include Island

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOODWAY DATA

STEHEKIN RIVER

5.0 INSURANCE APPLICATION

To establish actuarial insurance rates, data from the engineering study must be transformed into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHFs), and the flood insurance zone designations for each flooding sources studied by detailed methods affecting the unincorporated areas of Chelan County.

5.1 Reach Determinations

Reaches are defined as sections of floodplain that have relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference may not have a variation greater than that indicated in the following table for more than 20 percent of the reach:

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

Sixty reaches meeting the above criteria were required for the flooding sources of Chelan County. These included nineteen on Wenatchee River, sixteen on Mission Creek, six on Squilchuck Creek, five on Chumstick Creek, four each on Peshastin and Icicle Creeks, two on Stehekin River and one each on Chiwawa, Entiat and Mad Rivers, and one on Nason Creek. The locations of the reaches are shown on the Flood Profiles (Exhibit 1).

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations rounded to the nearest one half foot, multiplied by 10, and shown as a three-digit code. For example, if the difference between the water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year flood water-surface elevations is greater than 10.0 feet, it is rounded to the nearest whole foot.

5.2 Flood Hazard Factors

The FHF is used to establish relationships between depth and frequency of flooding in any reach. This relationship is then used with depth-damage relationships for various classes of structures to establish actuarial rate tables.

5.3 Flood Insurance Zones

Flood insurance zones and zone numbers are assigned based on the type of flood hazard with the FHF, respectively. A unique zone number is associated with each possible FHF, and varies from 1 for a FHF of 005 to a maximum of 30 for a FHF of 200 or greater. These zones are as follows:

Zone A

Special Flood Hazard Areas (SFHAs) inundated by the 100-year flood, determined by approximate methods; no base flood elevations (BFEs) shown or FHFs determined.

Zone AO

SFHAs inundated by types of 100-year shallow flooding where depths are between 1.0 and 3.0 feet; depths are shown, or areas of 100-year alluvial fan flooding, depths and velocities shown, but no FHF are determined.

Zones A1-A11

SFHAs inundated by the 100-year flood, determined by detailed methods; with BFEs shown, and zones subdivided according to FHFs.

Zone B

Areas between the SFHAs and the limits of the 500-year flood; areas that are protected from 100- and 500-year floods by dike, levee, or other water control structure; areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.

Zone C

Areas of minimal flooding; not subdivided.

Flood elevation differences, FHFs, flood insurance zones, and BFEs for each flooding source studied by detailed methods in the community are summarized in Table 3.

Alluvial fan flood hazard areas are shown on the Flood Insurance Rate Map (published separately) as Zone AO, with average depths and velocities of flow given. In these areas, depths of the 100-year flood may exceed 3 feet. Development on alluvial fans is subject to a more severe flood hazard than would normally be encountered in Zone AO due to high velocities and the unpredictability of the location of the stream channel across the width of the fan.

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
Wenatchee River							
Reach 1	0625	-0.3	-0.1	0.2	005	A1	Varies - See Map
Reach 2	0625	-1.6	-0.4	0.9	015	A3	Varies - See Map
Reach 3	0625,0600	-2.2	-0.6	1.3	020	A4	Varies - See Map
Reach 4	0600	-1.7	-0.5	1.0	015	A3	Varies - See Map
Reach 5	0600	-2.3	-0.7	1.4	025	A5	Varies - See Map
Reach 6	0600,0800	-1.8	-0.5	1.0	020	A4	Varies - See Map
Reach 7	0800	-2.8	-0.8	0.9	030	A6	Varies - See Map
Reach 8	0800	-1.6	-0.4	0.9	015	A3	Varies - See Map
Reach 9	0800	-2.1	-0.6	1.2	020	A4	Varies - See Map
Reach 10	0800	-1.3	-0.4	0.7	015	A3	Varies - See Map
Reach 11	0800	-1.9	-0.5	1.1	020	A4	Varies - See Map
Reach 12	0800	-1.6	-0.4	0.9	015	A3	Varies - See Map
Reach 13	0800	-2.1	-0.5	1.2	020	A4	Varies - See Map
Reach 14	0800	-2.3	-0.7	1.3	025	A5	Varies - See Map
Reach 15	0800	-1.5	-0.4	0.9	015	A3	Varies - See Map
Reach 16	0800	-2.5	-0.7	1.5	025	A5	Varies - See Map
Reach 17	0800	-1.5	-0.4	0.9	015	A3	Varies - See Map
Reach 18	0775	-1.0	-0.3	0.6	010	A2	Varies - See Map
Reach 19	0775,0575	-1.5	-0.4	0.8	015	A3	Varies - See Map

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

WENATCHEE RIVER

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NAVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
Mission Creek							
Reach 1	0600	-1.7	-0.5	3.4	015	A3	778
Reach 2	0600	-2.9	-0.9	4.8	030	A6	Varies - See Map
Reach 3	0600	-5.2	-1.7	2.4	050	A10	Varies - See Map
Reach 4	0600	-2.4	-0.5	1.3	025	A5	Varies - See Map
Reach 5	0600	-3.7	-0.8	2.4	035	A7	Varies - See Map
Reach 6	0600	-3.1	-0.9	2.0	030	A6	Varies - See Map
Reach 7	0600	-5.4	-2.1	1.4	055	A11	Varies - See Map
Reach 8	0600	-1.9	-0.7	0.8	020	A4	Varies - See Map
Reach 9	0600	-3.9	-1.9	1.1	040	A8	Varies - See Map
Reach 10	0600,0525	-2.5	-0.6	1.6	025	A5	Varies - See Map
Reach 11	0625	-5.2	-2.0	2.0	050	A10	Varies - See Map
Reach 12	0625	-4.0	-1.1	1.5	040	A8	Varies - See Map
Reach 13	0625	-4.8	-1.0	1.8	050	A10	Varies - See Map
Reach 14	0625	-4.0	-0.9	1.9	040	A8	Varies - See Map
Reach 15	0625	-4.8	-1.4	3.4	050	A10	Varies - See Map
Reach 16	0625	-3.6	-1.1	2.2	035	A7	Varies - See Map
Peshastin Creek							
Reach 1	0800	-1.8	-0.5	1.2	020	A4	Varies - See Map
Reach 2	0800	-1.1	-0.3	0.6	010	A2	Varies - See Map
Reach 3	0800	-1.7	-0.5	1.0	015	A3	Varies - See Map
Reach 4	0800	-2.9	-0.9	3.3	030	A6	Varies - See Map

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

MISSION CREEK-PESHASTIN CREEK

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION IN FEET [3]
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
Icicle Creek							
Reach 1	0800	-1.4	-0.4	0.8	015	A3	Varies - See Map
Reach 2	0800	-2.4	-0.7	1.5	025	A5	Varies - See Map
Reach 3	0800	-3.2	-0.9	1.9	030	A6	Varies - See Map
Reach 4	0800	-1.8	-0.5	1.1	020	A4	Varies - See Map
Chumstick Creek							
Reach 1	0800	-1.6	-0.5	1.6	015	A3	Varies - See Map
Reach 2	0800	-2.5	-0.7	1.2	025	A5	Varies - See Map
Reach 3	0800	-1.7	-0.6	1.4	015	A3	Varies - See Map
Reach 4	0800	-1.0	-0.3	1.1	010	A2	Varies - See Map
Reach 5	0775,0800	-1.3	-0.4	1.0	015	A3	Varies - See Map
Chiwawa River							
Reach 1	0550,0575	-1.2	-0.4	0.8	010	A2	Varies - See Map
Entiat River							
Reach 1	0375,0400	-1.2	-0.4	0.8	010	A2	Varies - See Map
Mad River							
Reach 1	0375	-1.5	-0.4	0.8	015	A3	Varies - See Map
Stchekin River							
Reach 1	0300	-0.9	-0.2	0.5	010	A2	Varies - See Map
Reach 2	0300	-0.7	-0.2	0.4	005	A1	Varies - See Map

[1] Flood Insurance Rate Map Panel [2] Weighted Average [3] Rounded to Nearest Foot

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

ICICLE CREEK-CHUMSTICK CREEK-CHIWAWA RIVER-ENTIAT RIVER-MAD RIVER-STEHEKIN RIVER

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100 - YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION (FEET NGVD)[3]
		10% (10 - YEAR)	2% (50 - YEAR)	0.2% (500 - YEAR)			
Nason Creek Reach 1	0775,0750	-1.5	-0.4	1.1	015	A3	Varies-See Map

[1] Flood Insurance Rate Map Panel [2] Weighted Average [3] Rounded to Nearest Foot

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA
(Unincorporated Areas)

FLOOD INSURANCE ZONE DATA

NASON CREEK

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (FEET NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
Squilchuck Creek							
Reach 1	0625	-2.7	-0.9	3.5	025	A5	Varies - See Map
Reach 2	0625	-4.4	-0.9	1.7	045	A9	Varies - See Map
Reach 3	0625	-2.0	-0.7	1.5	020	A4	Varies - See Map
Reach 4	0625	-1.3	-0.3	0.8	015	A3	Varies - See Map
Reach 5	0625	-2.2	-0.6	1.2	020	A4	Varies - See Map
Reach 6	0625,0650	-1.2	-0.3	0.8	010	A2	Varies - See Map
No. 1 Canyon							
Alluvial Fan Flooding	0625	N/A	N/A	N/A	N/A	A0	Depth 1[4]
Alluvial Fan Flooding	0625	N/A	N/A	N/A	N/A	A0	Depth 2[4]
No. 2 Canyon							
Alluvial Fan Flooding	0625	N/A	N/A	N/A	N/A	A0	Depth 1[4]
Alluvial Fan Flooding	0625	N/A	N/A	N/A	N/A	A0	Depth 2[4]
Dry Gulch							
Alluvial Fan Flooding	0625	N/A	N/A	N/A	N/A	A0	Depth 1[4]

[1]Flood Insurance Rate Map Panel [2]Weighted Average [3]Rounded to Nearest Foot [4]See Map for Velocities

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHELAN COUNTY, WA

(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

SQUILCHUCK CREEK-NO. 1 CANYON-NO. 2 CANYON-DRY GULCH

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map (FIRM) for Chelan County is, for insurance purposes, the principal product of the Flood Insurance Study. This map contains the official delineation of flood insurance zones and BFEs. BFE lines show the locations of expected whole-foot water-surface elevations of the base (100-year) flood. The BFEs and zone numbers are used by insurance agents, in conjunction with structure elevations and characteristics, to assign actuarial insurance rates to structures and contents insured under the NFIP.

6.0 OTHER STUDIES

The results of the USGS report on the 100-year floodplain along the White River (Reference 25) were incorporated into this study without change for the White River approximate study area.

The Entiat River in Chelan County had been previously studied by R.W. Beck and Associates (Reference 11). The profiles were checked and matched except in areas where the differences were due to the small number of cross sections or the difficulties in scaling data used in the earlier report.

Due to the tailings impoundment constructed at the Asamera Minerals Canyon Mines project, flood hazard on Dry Gulch's alluvial fan has decreased. Therefore, the results of this restudy at the border between Chelan County and the City of Wenatchee do not agree with the published Flood Insurance Study for the City of Wenatchee (Reference 31).

Flood Insurance Studies have also been performed for the incorporated Cities of Cashmere, Leavenworth, and Chelan (References 32 to 34, respectively). All of these studies are in agreement with this Flood Insurance Study.

This Flood Insurance Study supersedes the previously published Flood Insurance Study for Chelan County, Washington (Reference 35). This Flood Insurance Study is authoritative for purposes of the NFIP and the data presented here either supersede or are compatible with previous determinations.

7.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, Federal Regional Center, 130 228th Street, S.W., Bothell, Washington 98021-9796.

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